Sectoral Sources of Connecticut Job Growth

By Steven P. Lanza

As Connecticut struggles to shake off the recession and rebuild its economy, analysts ponder which of the state's industrial sectors will generate future job growth. The question is more than academic. Businesses and individuals who must make decisions today about capital investments or education and training can't wait until tomorrow to discern new economic trends.

Connecticut has long relied on the strength of its finance, insurance and manufacturing sectors to power its economy. The state, even now, has a greater-than-average concentration of jobs in those sectors—evidence of a comparative advantage that allows Connecticut to specialize in the production of goods and services in these industries and then trade profitably with other states and countries. But sectors of Connecticut's economy that stood as pillars of past success need not offer the same support in the future. Where, then, will new job growth originate?

A Brief Methodological Excursion

Identifying the drivers of employment growth is complicated because sectors often move up and down in tandem, even when growth in one sector is simply a reflex to growth in other sectors. Fortunately, it is possible to disentangle those effects and identify the key sectoral sources of new employment in Connecticut, with a modeling technique called vector autoregression, or VAR. This technique uses a system of equations, one for each variable of interest, in which each variable is modeled as a function of its own past values and the past values of all the other variables. Model estimates show how a given variable responds to sudden changes, or shocks, in its own or other values.

Because of its interlocking structure, a VAR can capture complex interdependencies among sectors of the economy. Total Connecticut employment, for example, is expressed as a function of its own past values as well past employment in the state's separate industrial sectors (which are themselves functions of their own and other past values). A VAR can also help quantify the impact of outside forces acting on the Connecticut economy, such as oil price spikes or changes in U.S. output and job growth, thus illustrating the degree to which Connecticut's economic fate is tied to that of the nation or the world.

I modeled the interaction of monthly changes in 13 key national and state variables over the period 1989 to 2000—the most recent complete business cycle. The five national variables consisted of oil prices, U.S. real GDP and employment, and (to capture the effects of monetary and fiscal policy) the federal funds rate and the federal deficit. The Connecticut-specific variables were employment in seven of the state's key industries—finance, insurance and real estate (FIRE), manufacturing, services, trade, government, transportation, communications and utilities (TCU) and construction—plus total statewide employment.

In setting up a VAR, the order in which the variables enter the model is important: those that are logically prior to others should appear first. In my analysis, variables with national effects precede variables with strictly local effects, to capture the idea that Connecticut activity depends on the national economy. And in rank-ordering Connecticut-specific industries, those with an export focus, such as FIRE and manufacturing, precede those with a focus on serving local markets, such as construction.

As Goes the Nation...

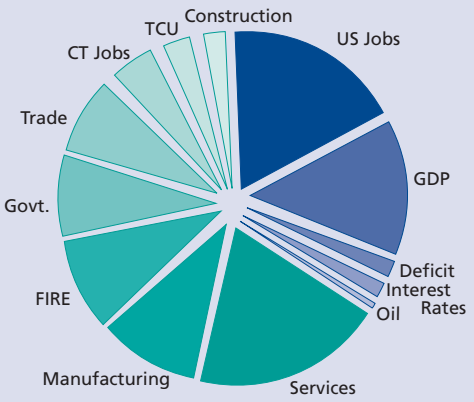
The accompanying pie chart documents the results of this exercise. According to the model, economic shocks at the national level explain only about a third of the total variation in Connecticut job growth over the 1989-2000 period (the blue slices), with most of the effects lasting about a year. Shocks from the state's economy, by contrast, account for fully 65% of the variation in job growth (the green slices). These findings are consistent with other research on the relative importance of similar variables for metropolitan job growth in many regions across the U.S.

Among the outside forces influencing the Connecticut economy, oil prices have the smallest effect—in fact accounting for next to none (less than 1%) of the total variation in job growth. What little impact there is shows up in the state's energy-hungry manufacturing and transportation sectors, but even there the influence on job growth is barely 5% of the total within those sectors. Federal monetary and fiscal policies also appear to have little influence on Connecticut job growth. Changes in the federal deficit and in interest rates have an impact of about 1.5% each. The effects on services and manufacturing job growth from changes in monetary policy appear modestly higher, perhaps because investment in these sectors is more interest-rate-sensitive than in others.

By far the most significant national influences on Connecticut job growth are changes in real GDP and in total U.S. employment. U.S. job growth is the second biggest influence on total Connecticut job growth, and GDP growth is third biggest. Together, these two variables account for 32% of the total variation in Connecticut job growth.

Besides influencing on total jobs statewide (as illustrated in the pie chart), national GDP and

Decomposing the Sources of Connecticut Job Variation



Source: Developed by *The Connecticut Economy* based on data from the U.S. Bureau of Labor Statistics and the Federal Reserve.

employment also have effects on jobs on a sector by sector basis (not shown in the chart). Such effects are, however, much smaller than they are for the state as a whole. At one extreme, in the case of FIRE, barely 4% of the variation in jobs can be traced to changes in GDP and national employment, while a whopping 91% of the variation results from changes specific to the FIRE industry. At the opposite extreme, 27% of the variation in jobs in the trade sector stems from GDP and national employment, while the sector itself accounts for just over half of its own variation. For all sectors in the Connecticut economy, changes in GDP and in U.S. jobs combined typically account for only about a tenth of the variation in sectoral job growth. But in every case, more than half of the job variation within sectors comes from shocks unique to those sectors.

Home Grown Growth

The results so far strongly suggest that the state's fortunes are tied to some extent to the performance of the nation's economy. But the big green area of the pie chart reminds us that Connecticut must largely make its own luck: most of the variation in total Connecticut job growth is a product of the performances of the state's separate sectors. Over the most recent business cycle, services accounted for the greatest proportion of the variance in total employment (19%), trailed by manufacturing (10%), FIRE (9%), and government (8%).

The strong showing from services suggests that this sector may, as many suspect, be eclipsing FIRE and manufacturing as a job powerhouse. Without a doubt, the business-service and health-related segments of the economy scored some impressive gains in the 1990s (see Dennis Heffley's piece on pages 6-7). And government's competitive position in the lineup reflects the emergence of a casino gambling industry over that same period of time (see Art Wright's piece on pages 12-13), because jobs at the Mohegan Sun and Foxwoods casinos, which are owned by Indian tribes, are counted under the government sector.

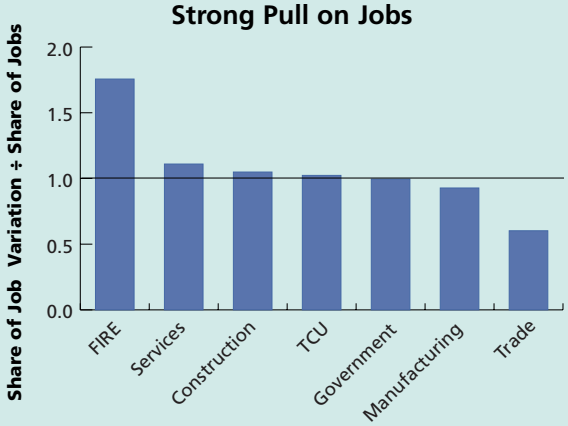
By another index, however, the influence of the state's FIRE sector remains significant. Though FIRE accounts for about 9% of the total variation in job growth from national and local influences combined (the blue segments of the pie chart, plus the green segments), it accounts for fully 15% of the variation from the local sector (the green segments) alone. Over the last business cycle, however, FIRE comprised 9% of total Connecticut jobs, so its influence over job changes exceeded its share of job totals. So too the services sector, which accounted for 32% of the total variation in job growth coming from the local sectors, even though it housed 29% of total jobs.

The accompanying bar chart illustrates the *relative* job generating strength of the sectors by graphing the ratio of the share of employment variation to the share of total state employment. Sectors with ratios above 1.00 exert especially strong employment leverage (e.g., services), and vice versa (trade). Construction, TCU and government appear to wield an influence over total job changes that is commensurate with their size. The case of government may seem especially odd—surprisingly high to those who see government as an impediment to growth; surprisingly low to those who might have expected an extra boost from the massive growth in casinos during the period of study. The relative lack of strength of the manufacturing sector, which comes in with an index value of 0.93, is also notable. One consolation is that, though manufacturing employment is caught in a long secular decline, job losses in this sector likely engender relatively few additional losses elsewhere in the state's economy.

Where Do We Go From Here?

Job losses today aren't just limited to the manufacturing sector, but when jobs do begin to return we'll want to know where to start looking for them. Under the Connecticut economy's current structure, job growth is largely the product of local sector dynamics, and some key sectors—FIRE, services, government—carry special weight. To be sure, national events do have an influence, but that influence is relatively limited. For example, oil price shocks—always a topic of concern and especially now as the Middle East again heats up—appear to be easily absorbed by the state's economy. Most of the variation in job growth depends on developments within Connecticut's separate industrial sectors. The state's service sector, not usually considered a key export industry, nevertheless appears to be a significant source of job growth. Manufacturing and FIRE, long the linchpins of Connecticut job growth, seem to be on different tracks: manufacturing's clout is diminished, but FIRE is still riding high.

FIRE and Services Exert A Relatively Strong Pull on Jobs



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